

mid-sized exchange carriers by effectively prohibiting them from providing PCS to their customers. (5)

UTILITIES TELECOMMUNICATIONS COUNCIL

Interest: Organization whose members operate private microwave systems in band affected by the order.

Band Plan:

- Supports APCO petition, which is consistent with UTC's, requesting that the FCC reserve a portion of the 2 GHz emerging technologies band for public safety and other privately licensed users of advanced communications services. (2-6)
- No additional spectrum from the 2 GHz band should be allocated for mobile satellite services. The 40 MHz of spectrum in the 2 GHz band and the 60 MHz of spectrum for domestic MSS use are sufficient for the deployment of these services. Arguments that there is insufficient spectrum for all current applicants should be disregarded. The FCC should allocate enough spectrum to ensure that MSS services will be available. It should not insist that there be enough to accommodate the plans of all potential service providers. (6-8)

Service Areas:

- Reaffirms UTC's own petition and supports others who request that the FCC adopt its own definitions of PCS licensing areas and avoid using Rand McNally materials that may subject licensees to copyright infringement claims. (19-20)

Power Limits:

- Does not oppose an increase in the power/height limits as long as this increase is accompanied by appropriate protection for fixed microwave users, such as strict implementation of interference standards. (15)
- Supports API's request that the FCC adopt specific penalties to deter interference to fixed microwave users and that the FCC clarify that when an incumbent microwave user notifies a PCS licensee that interference is occurring, the PCS licensee must immediately cease operations until the interference problem has been resolved. (15-16)

Interference Standards:

- Supports requests of TIA, Alcatel, and Motorola that Bulletin TSB10-F may be used instead of Appendix D. (17)

Other:

- Supports Northern Telecom's request that PCS licensees be permitted to provide fixed services without separately attempting to measure relative capacity, service offerings, or revenue associated with primary and ancillary service offerings.
(18)

AMERICAN PETROLEUM INSTITUTE

Interest: Trade association for companies involved in the petroleum and natural gas industries.

Measurement and Certification Procedures:

- API takes no position on the spectrum etiquette method adopted by the Commission, but urges that the method adopted must provide maximum interference protection to the operations of adjacent channel POFS licensees. (7)

Coordinatable Devices:

- API takes no position on whether UTAM should be an exclusive spectrum entry management entity, or on whether UTAM should be involved in the unlicensed PCS type acceptance process. (7)
- API agrees with the Commission that proposals affecting UTAM or any other unlicensed PCS management organization must be made available for public comment and that procedures adopted by the Commission or such an organization must ensure adequate interference protection to adjacent channel fixed operations. (8)

APPLE COMPUTER, INC.

Interest: Computer manufacturer and Data-PCS proponent.

Band Plan:

- Opposes suggestions by APCO and UTC for spectrum for "private PCS" and does not believe any unlicensed spectrum should be reallocated. (8-9)

Role of UTAM:

- The FCC should define more clearly the responsibilities of UTAM; argues that UTAM is seeking to broaden the range of disabling techniques for early deployed systems and states that the FCC does not appear to agree that manufacturers may balance non-interference concerns against cost considerations. (6-7)

Coordinatable Devices:

- Supports Bell Atlantic proposal to require microwave operators to upgrade their facilities if the PCS operator agrees to pay and the upgrade is at least as reliable as the original link; the policy should also be extended to retuning microwave facilities and to apply in the unlicensed bands. (7)

Channellization and Access Rules:

- The FCC should eliminate the restrictive channelization of the isochronous band to ensure the ability to deploy the broadest range of new technologies. (5-6)

Packing Rule:

- Petitioners support elimination of the packing rule for the isochronous bands; Apple also supports extension of such changes to the asynchronous band. (2)

Cooperating Devices:

- Supports Spectralink petition regarding use of different monitoring deferral thresholds for a "family of devices" and extension of such policies to the asynchronous band. (3)

ASSOCIATION OF AMERICAN RAILROADS

Interest: Trade association of railroad companies and frequency coordinator for land mobile radio services.

Role of UTAM:

- Agrees with Apple that the rules should be amended to reflect the conditional nature of UTAM's authority. (7)
- Concurs with UTAM that the FCC should be responsible for identifying those devices considered to be "coordinatable." (7)
- Agrees with UTC that UTAM should be held responsible for verifying the installation or relocation of "coordinatable" devices for which it has conducted coordination, since UTAM is the only entity against which the FCC can take enforcement actions. (8)

Labelling Requirements: Believes that UTC's suggested labeling language should be adopted. (8)

BELL ATLANTIC PERSONAL COMMUNICATIONS, INC.

Interest: Regional Bell Operating Company PCS affiliate.

No Radio Common Carrier Use of Band:

- Opposes AT&T proposal to limit the types of services (*e.g.*, third party wireless payphones) that can be deployed in the unlicensed band as antithetical to the flexibility principles inherent in the PCS order. (13)

ERICSSON CORPORATION

Interest: Equipment manufacturer.

Guidelines for Unlicensed PCS Rules:

- Suggesting that the following guiding principles be followed for unlicensed PCS rules:
 - the rules should allow more freedom rather than less freedom or valuable experience with the unlicensed concept could be missed;
 - the best coexistence and avoidance is provided by the largest possible contiguous frequency band accessible for any technology;
 - any rules conserving the idea of ownership of spectrum conflict with the listen-before-talk scheme of common resources;
 - reliable coexistence is based on monitoring before transmitting and halting when communications are finished or no acknowledgement is received; and
 - reliable coexistence is based on a high probability that a device, when interfered with, can find another access channel on which to escape.
- (A2)

Channelization and Access Rules:

- Current channelization does not support CDMA, is not the consensus of the industry, is a relic of spectrum "ownership", and insulates narrowband technologies from fair competition from wideband technologies. (A3-A4)
- A majority in the last WINTech meeting and the last Telocator T&E meeting voted to remove the channelization requirement but were blocked by the minority. (A4)

Duplex Devices:

- With other companies, supports changes to facilitate duplex operation, but prefers its own language over other suggestions. (A7)

Packing Rule:

- Supports elimination of the packing rule, but for different reasons than other commenters, and also supports the Rockwell request for a limit on the total amount of spectrum occupied by a device. (A11)

Measurement and Certification Procedures:

- Believes ± 3 dB tolerance requirement in threshold rules should be a one-sided requirement, since this is the correct engineering solution. (A8)

Emissions Limits:

- Supports revising the out-of-band emissions limit from 40 dB to 30 dB, but since it does not favor fixed channelization, this limit should apply only to sub-bands. (A7)

Power Limits:

- Does not support allowing an envelope peak 10 dB above the defined maximum power limits since it may cause interference and believes WINForum made a mistake in requesting such a change because it was not decided at the last WINTech meeting. (A8)

Channel Monitoring Rules:

- Does not agree with petitioners that the 60 dB limit should be measured in a bandwidth equal to the transmission bandwidth, and suggests use of a measurement bandwidth of 1.25 MHz. (A7-A8)
- Also does not agree with Apple that the 60 dB limit should be modified to 50 dB, since it should be increased, if anything. (A8)
- Agrees with AT&T that language requiring monitoring of only 40 channels would be better; better yet would be language requiring monitoring of 40 channels, or less if 40 are not available, within the last 10 ms. (A8-A9)
- Language in § 15.321(c)(5) stating "defined for a system" should be revised to "defined for a device." (A9)
- Agrees with Spectralink that there is a potential problem with the KTB + 50 dB threshold, and suggests increasing the threshold by 10-15 dB. (A9-A10)

- Requests clarification on the interpretation of the monitoring rules for DS-CDMA devices. (A10)

Acknowledgement Rules:

- Suggests reinstatement of a modified marker transmission definition from WINForum Etiquette V16 that would: (1) ensure channels are not seized for long periods of time by transmitting continuous, unacknowledged markers; (2) avoid raising the signaling and set-up time to 30 seconds; and, (3) allow a more extended time for marker transmissions (30 seconds) where continuous transmission is required and compensation for sleep cycles may be needed. (A5-A7)

Other:

- Opposes Northern Telecom's suggested revisions to 15.321(c)(11) for multicarrier/shared antennas. (A12)
- Believes AT&T exaggerates the testing problem, and believes some suggested procedures could be replaced by manufacturer declarations. (A13)

GTE SERVICE CORPORATION

Interest: Manufacturer and local exchange and cellular service provider.

No Radio Common Carrier Use of Band:

- GTE urges the Commission to take great care to ensure that, if some clarification is deemed necessary, the Commission does not imply that radio common carriers or their affiliates face any special limitations on their participation in the provision of systems and devices where consistent with the Spectrum Etiquette and other Part 15 requirements. (13)

MOTOROLA INC.

Interest: Equipment manufacturer.

Emissions Limits:

- Opposes petitions for reconsideration seeking to weaken or reduce the emission limits in the first adjacent 1.25 MHz channel; in particular, since the current rule specifies attenuation of 40 dB based on a 1 percent resolution bandwidth and the WINforum proposal specified attenuation of 30 dB based on integration of the total emissions in the band, Motorola opposes unilaterally changing the 40 dB specification unless corresponding changes are made in the measurement procedure to integrate total emissions. (4)

NORTHERN TELECOM

Interest: Equipment manufacturer.

Band Plan:

- Opposes requests to allocate the lightly populated part of the unlicensed band for asynchronous devices for technical reasons already part of the record. (13-14)

Role of UTAM:

- Apple's comments appearing to challenge UTAM's good faith are unwarranted; UTAM is an open forum that Northern Telecom anticipates will successfully develop and implement a plan for clearing the spectrum for both asynchronous and isochronous devices and will fairly coordinate deployment of coordinatable devices. (17)

Channelization and Access Rules:

- Opposes suggestions for wider channelization; although these petitioners argue that increasing the bandwidth will create diversity, increased bandwidth allows devices to monopolize spectrum. (13)

Cooperating Devices:

- Because "cooperating devices" are not defined, if raising the threshold is appropriate for "cooperating devices," it should be appropriate for all devices. (15)

Measurement and Certification Procedures:

- Opposes AT&T's comprehensive measurement procedures for type acceptance; urges instead retaining the existing rules. (16)

Channel Monitoring Rules:

- Opposes suggestions to modify the listen-before-talk period from 10 to 20 ms; devices can listen longer if necessary and doubling the time will increase call set up delays. (14-15)

OMNIPOINT CORPORATION, INC.

Interest: 2 GHz Pioneer's Preference recipient and spread spectrum equipment manufacturer.

Channelization and Access Rules:

- A maximum channel of 1.25 MHz is technically indefensible and limits the types of technologies that can be deployed. (2, 5-7)
- Supports the position of Apple and more than 70 percent of the Telocator T&E committee that 5 MHz channelization should be permitted; Motorola's highway lane analogy limits the type of "vehicles" that can be implemented in the unlicensed bands. (2, 7-8)

Duplex Devices:

- Opposes the suggestion of Northern Telecom to allow an exception to the listen-before-talk rules for duplex devices as predatory and unfair to other devices; however, it supports the proposal to allow establishment of an immediate duplex connection. (3-4, 11-12)

Packing Rule:

- Opposes the suggestion of Northern Telecom that any packing rule is inefficient; proposes a "fair" packing rule to start in less interference prone parts of the band. (2-3, 9-10)
- Failure to have any packing rule will randomly distribute narrowband devices across the available spectrum and limit access to spectrum by broadband devices. (10)

Channel Monitoring Rules:

- Supports position of majority of the Telocator T&E committee and other WINTech members that the listen-before-talk period be expanded from 10 ms to 20 ms. (3-4, 11)
- Supports Telocator regarding the need to modify the 10 ms/X (where X is an integer) and corresponding frame time to 20 ms/X to allow the widest range of technologies. (4, 13)

No Radio Common Carrier Use of Band:

- While expressing no opinion on whether the unlicensed bands could or should be generally used for fee-based services, Omnipoint believes the FCC should not bar the licensed PCS community from using any devices or techniques which allow interoperability with the unlicensed bands. (4, 12-13)

PACIFIC BELL AND NEVADA BELL

Interest: Bell Operating Companies.

No Radio Common Carrier Use of Band:

- Opposes AT&T's proposed limitation on common carrier use of the unlicensed device band as anticompetitive; the FCC should clarify that wireless centrex is a permissible use of unlicensed frequencies. (iii, 11-12)

Other:

- The Spectrum Etiquette should be reviewed by an open industry forum. (iii, 10-11)

ROLM

Interest: Major American manufacturer of PBXs.

Band Plan:

- There should not be two different isochronous bands; the same characteristics must be applicable to all devices in either sub band. Otherwise, technologies will develop according to UTAM band clearing priorities. (2)

Channelization and Access Rules:

- Agrees with Ericsson, Lace, Rockwell, and others that the FCC should eliminate the fixed channelization scheme defined in the isochronous band since this restricts the deployment of certain technologies and unduly favors narrowband systems. The FCC should limit spectrum utilization by a percentage of the band. (1-2)

Duplex Devices:

- Agrees with requests that § 15.321(c)(1) should be modified to permit a device to respond to a transmission initiated by a complimentary device in a predefined time/frequency window without the frequency search required by § 15.321(b) and with a simplified access protocol. (2)

Packing Rule:

- Agrees with requests that the frequency search requirement of § 15.321(b) is not required since there is little benefit to be gained by starting a frequency search at a particular band edge depending on the bandwidth of the signal. (2)

Emissions Limits:

- Agrees with requests that adjacent channel emissions be relaxed to -30 dB from the defined -40 dB and that the ± 3 dB accuracy defined in § 15.321(c)(8) be modified. PCS devices should not need to measure power absolutely, they should only be required to ensure that they do not exceed limits specified elsewhere by more than 3 dB. (2-3)

Acknowledgement Rules:

- Agrees with Motorola that a device should not be allowed to transmit for up to 8 hours even in the absence of any acknowledgement. Continuous unacknowledged transmissions should not be allowed. (3)

TELOCATOR

Interest: Trade association of PCS interests

Channelization and Access Rules:

- The 10 ms period specified in the "listen before talk" rules should be increased to 20 ms, as this will accommodate a greater range of new technologies in the unlicensed device band without perceivably affecting end-user response times.
(12)

UTAM, INC.

Interest: FCC designated coordinator for the transition of 2 GHz spectrum from fixed microwave service to unlicensed PCS.

Coordinatable Devices:

- Agrees with UTC that whether or not a device is coordinatable is an issue to be decided by the FCC in the equipment authorization process; similarly, authority to sanction rule violators rests with the FCC. (3-4)
- A requirement to incorporate technological means for verification of installation location into each unlicensed PCS system or device is unnecessary and contrary to the goals of PCS deployment since it would limit the types of devices and technologies that could be deployed. (4-5)
- Disagrees with UTC that the rules are imprecise and argues that the FCC should not adopt an excessively restrictive definition of "coordinatable PCS device." (5-6)
- UTAM is uncertain how to interpret UTC's request to hold UTAM "fully responsible" for verifying PCS equipment installations and relocations; UTAM should have no greater obligation than to faithfully perform its coordination functions under a plan approved by the FCC. (6)
- Because the rules do not specify a methodology for interference calculation for coordinating unlicensed devices, UTAM will be addressing such concerns in its relocation plan filing; UTAM anticipates relying on the consensus TSB10-F guidelines. (6-8)

Other:

- Supports APC and Telocator requests to delete the ± 5 m antenna location accuracy requirement in § 99.53(e) of the rules as unnecessary and burdensome. (8)

UTILITIES TELECOMMUNICATIONS COUNCIL

Interest: Organization whose members operate private microwave systems in band affected by the order.

Coordinatable Devices:

- The FCC should determine which devices are coordinatable. Otherwise, UTAM will be placed in the awkward position of having to determine which devices can be put on the market. Supports UTAM's position that UTAM should limit its participation in the equipment authorization process to bringing to the FCC's attention cases where an unlicensed device or system lacks the requisite FCC equipment authorization or cannot be coordinated without an unacceptable risk of harmful interference. (9-10)
- The FCC should require the incorporation of a location verification capability within coordinatable systems and the devices. The use of procedures, such as licensed installers, will not prevent premature activation or relocation. Since only UTAM and the manufacturers and vendors can be held accountable for the interference of these devices, they should support the inclusion of interference avoiding technologies. (11-13)

**WIRELESS INFORMATION NETWORKS FORUM
("WINFORUM")**

Interest: Trade association of equipment manufacturers interested in unlicensed PCS devices.

Channelization and Access Rules:

- Petitioners agree that the limitation on signaling and control information should be revised from 1 to 30 seconds. (2)
- Opposes attempts to revise the channelization of the bands as being incompatible with the goal of the Spectrum Etiquette, exclusionary, and previously rejected by the Commission. (3)

Duplex Devices:

- Petitioners agree that a new section should be added to facilitate duplex connections. (2)

Packing Rule:

- Petitioners agree that the packing rule should be eliminated. (2)

Emissions Limits:

- Petitioners agree that the emissions limits should be clarified. (2)

Power Limits:

- Petitioners agree that the method of power measurement should be revised. (2)